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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,459	11/03/2003	Paul R. Labute	6824-1	3455

39196 7590 09/18/2008

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EXAMINER	
WHALEY, PABLO S	

ART UNIT	PAPER NUMBER
1631	

MAIL DATE	DELIVERY MODE
09/18/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,459	LABUTE, PAUL R.	
	Examiner	Art Unit	
	PABLO WHALEY	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 May 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-15* is/are pending in the application.

4a) Of the above claim(s) *4-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 2* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination

Receipt is acknowledged of a request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission, filed on 01/05/2007. The submission, however is improper because the MPEP (Section 1.114) states that a proper Request for Continued Examination requires that prosecution in an application be closed. In the instant case, prosecution is not closed.

Since the submission appears to be a bona fide attempt to provide a complete reply to the prior Office action, applicant is given a shortened statutory period of ONE MONTH or THIRTY DAYS from the mailing date of this letter, whichever is longer, to submit a complete reply. This shortened statutory period for reply supersedes the time period set in the prior Office action. This time period may be extended pursuant to 37 CFR 1.136(a).

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Claims Under Examination

Newly submitted claim 12-15 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Related inventions are distinct if the inventions as claimed do not overlap in scope (i.e., are mutually exclusive); the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j).

In the instant case, elected claims 1, 2, and 3, in the response filed 04/17/2006, recite steps comprising calculating a numerical representation of molecules (step a), and estimating a probability distribution that n molecular descriptors were calculated from active compounds. However, newly added claims 12-15, filed in the amendment of05/15/2008, recite steps comprising obtaining a training set of

chemical compounds (step a), and estimating a probability distribution by assuming a probability distribution of a product groups is equal to a probability distribution of multidimensional vectors (step c). In addition, claims 12-15 in the amendment filed 05/15/2008 require other distinct steps directed to partitioning multidimensional vectors, and performing partitioning for each activity class. For these reasons, newly added claims 12-15, filed in the amendment of 05/15/2008,do not overlap in scope with the originally elected invention, elected in the response filed 04/17/2006. Therefore, the amendment of 05/15/2008 is directed to claims that are distinct since they recite different modes of operation which are not obvious variants of each other.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

(a) the inventions have acquired a separate status in the art in view of their different classification;

(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources,

or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original election for prosecution on the merits. Accordingly, claim 12-15 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claims 1, 2, and 4-15 are pending. Claim 3 is cancelled. Claims 4-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention or species, there being no allowable generic or linking claim.

Abstract

The abstract of the disclosure is acceptable. This objection is withdrawn in view of applicant's arguments, filed 05/18/2007.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in the United Kingdom on 2/19/1998. It is noted, however, that applicant has not filed a certified copy of the 9803466.3 application as required by 35 U.S.C. 119(b). This application has been granted the benefit of priority to US application 09/252,912, filed 2/9/1999.

Withdrawn Rejections

The rejection of claims 1-3 under 35 U.S.C. 101 for non-statutory subject matter is withdrawn in view of applicant's amendment of claim 1, filed 05/15/2008.

The rejection of claims 1-3 under 35 U.S.C. 112, second paragraph, is withdrawn in view of applicant's amendment of claim 1, filed 05/15/2008.

The rejection of claim 1 under 35 U.S.C. 102 (b) as being anticipated by Lawrence is withdrawn in view of applicant's amendment of claim 1, filed 05/15/2008.

The rejection of claims 1 and 2 under 35 U.S.C. 103(a) as being made obvious by Hahn in view of Bretthorst is withdrawn in view of applicant's amendment of claim 1, filed 05/15/2008.

Claim Rejections - 35 USC § 112, 2nd Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 is rejected due to its dependency from claim 1.

Claim 1 (step b, line 4) recites the limitation "the product of n one-dimensional distributions." It is unclear as to the metes and bounds of "one-dimensional distributions." This rejection is necessitated by applicant's amendment, filed 5/15/2008.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C.102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1 and 2 are rejected under 35 U.S.C. 102 (a) as being anticipated by Gao et al. (Journal of Chemical Information and Computer Sciences, 1999, Vol. 39, No. 1, p.164-168; Internet Publication Date: 12/16/1998; IDS filed 11/03/2003).

This rejection is newly applied.

Gao teaches a computer-based method for generating a quantitative structure activity relationship. In particular, Gao teaches a calculating a variable number of numerical descriptors (i.e. numerical representations of molecules) [p.165, Col. 1, ¶1, ¶2, p. 166, Col. 1, ¶1, ¶2, and Table 4]. Gao teaches estimating a probability distribution using molecular descriptors calculated for active and inactive compounds [Fig. 1], wherein the probability distribution step includes normalization of molecular descriptors by matrix multiplication [p.165, Col. 1, ¶2, ¶3]. Gao teaches using said probability distribution to estimate chemical compound activity [p.165, Col. 1, ¶3, ¶4]. Gao teaches displaying the probability that a chemical compound is active [Fig. 2]. Gao teaches Bayes Theorem for approximating probability distributions [p.165, Col. 1, ¶3, and Fig. 1].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being made obvious by Llorente et al. (Bioorganic & Medicinal Chemistry, 1996, Vol. 4, No. 1, pp. 61-71), in view of Bursi et al. (J. Chem. Inf. Comput. Sci., 1999, Vol. 39, p. 861-867), and in view of Bretthorst et al. (In Maximum Entropy and Bayesian Methods, P.F. Fougere, 1990, Kluver Academic Publishers, The Netherlands, p.1-27).

This rejection is newly applied in view of applicant's amendments, filed. 5/15/2008.

Llorente teaches a molecular model for analyzing compounds to predict activity [p.65, 3-D Model Building]. In particular, Llorente teaches constructing a numerical representation of molecules [Table 1], wherein each molecule is described numerically by various parameters, variables, and coefficients [Table 2, Table 4, p.70, Col. 1, ¶5, Col. 2, ¶1]. Llorente teaches training a QSAR model by analyzing active compounds [p.62, Col. 1, ¶3, and p.69, Col. 2, ¶3] and selecting models having good predictive properties by estimating a probability distribution [p. 70, Col. 1, ¶4]. Llorente teaches using optimal QSAR models for predicting compound activity against a particular target (i.e. DNA) [p.63, Col. 1, p.64, Col. 2, ¶2, p.70, Col. 1, ¶4], and displaying results [Table 5]. Llorente teaches estimating confidence levels (i.e. probability) that a chemical compound is active based on Bayesian probability distributions [p.70, Col. 1, ¶3].

Llorente does not teach "n" being the number of molecular descriptors used to represent a model, as in claim 1 (step a).

Llorente does not specifically teach an estimating step including the product of n one-dimensional distributions, as in claim 1 (step b).

Llorente does not specifically teach Bayes Theorem, as in claim 2.

Bursi teaches three-dimensional molecular descriptors for prediction of biological activity [Abstract[. In particular, Bursi shows various combinations of model descriptors and the use of increasing

numbers of model descriptors [p.864, Col. 2, Combined Descriptors] for the purpose of creating models with better statistics.

Bretthorst teaches estimating probability distributions using Bayes Theorem [Abstract, Section 2], and estimating the probability distribution comprising *m* one-dimensional distributions [Equation (7)], as in claim 1 (step b) and claim 2.

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify the quantitative structure-activity relationship (QSAR) analysis method of Llorente using n molecular descriptors, since numerically representing a model using "n" molecular descriptors is an arbitrary design consideration and since Llorente teaches a combination of at least seven molecular descriptors [Table 4]. One of ordinary skill in the art would have been motivated to represent molecules using "n" molecular descriptors in order to create models with improved statistics, as suggested by Bursi [p.864, Col. 2, Combined Descriptors].

It would further have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify the quantitative structure-activity relationship (QSAR) analysis method of Llorente using Bayes Theorem, as taught by Bretthorst, since Llorente teaches Bayesian analysis [p.70, Col. 1, ¶3, ¶4]. One of ordinary skill in the art would have been motivated to make the above modification in order to improve model selection when using larger data sets, as suggested by Bretthorst [p.1, Introduction and p.12, Example 3].

Response To Arguments

Rejection under 35 U.S.C. 102(b) as being anticipated by Lawrence

Applicant's arguments, filed 05/18/2007, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

Rejection under 35 U.S.C. 103(a) over Hahn in view of Bretthorst

Applicant's arguments, filed 05/18/2007, have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pablo Whaley whose telephone number is (571)272-4425. The examiner can normally be reached on 9:30am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached at 571-272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Pablo S. Whaley/

Patent Examiner

Art Unit 1631

/John S. Brusca/

Primary Examiner, Art Unit 1631